

DATA SCIENCE CONCENTRATION

Mathematics, Bachelor of Science with a Concentration in Data Science Requirements

Code	Title	Credits
GENERAL EDUCATION REQUIREMENTS - 46 Hours Required		
Minimum of "C-" required		
Fundamental Academic Skills		15
ENGL 1150	ENGLISH COMPOSITION I	
ENGL 1160	ENGLISH COMPOSITION II	
Writing in the Discipline Course		
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS ARGUMENTATION AND DEBATE	
MATH 1120 or MATH 1100 or MATH 1130 or MATH 1140 or MATH 1300 or STAT 1100 or STAT 1530	INTRODUCTION TO MATHEMATICAL AND COMPUTATIONAL THINKING DATA LITERACY AND VISUALIZATION QUANTITATIVE LITERACY QUANTITATIVE REASONING FOR HEALTHCARE PROFESSIONALS COLLEGE ALGEBRA WITH SUPPORT DATA LITERACY AND VISUALIZATION ELEMENTARY STATISTICS	
Distribution Requirements		31
Natural Science - From two disciplines and at least one lab - 7 hrs		
Social Science - From two disciplines - 9 hrs		
Humanities and Fine Arts - From two disciplines- 9 hrs		
Global Diversity - 3 hrs		
US Diversity - 3 hrs		
MAJOR REQUIREMENTS		
**Course will satisfy UNO's General Education requirement		
^Course requires pre-requisite(s)		
Mathematics Major with a Concentration in Data Science - 46 Hours Required		
Required Coursework		25
MATH 1950	CALCULUS I (^)	
MATH 1960	CALCULUS II	
MATH 1970	CALCULUS III	
MATH 2050	APPLIED LINEAR ALGEBRA	
MATH 2230	INTRODUCTION TO ABSTRACT MATH	
MATH 2350	DIFFERENTIAL EQUATIONS	
MATH 3230	INTRODUCTION TO ANALYSIS	
Select one of the following		3
CIST 1400	INTRODUCTION TO COMPUTER SCIENCE I	
MATH 2200	MATHEMATICAL COMPUTING I	
MATH 3250	INTRODUCTION TO NUMERICAL METHODS	
Select all of the following Data Science Concentration courses		15
MATH 3200 or CSCI 1620	MATHEMATICAL COMPUTING II (^) INTRODUCTION TO COMPUTER SCIENCE II	

MATH 4740	INTRODUCTION TO PROBABILITY AND STATISTICS I	
MATH 4750	INTRODUCTION TO PROBABILITY AND STATISTICS II	
STAT 4410	INTRODUCTION TO DATA SCIENCE	
STAT 4420	EXPLORATORY DATA VISUALIZATION AND QUANTIFICATION	
Select one of the following Data Science Concentration courses		3
MATH/CSCI 4300	DETERMINISTIC OPERATIONS RESEARCH MODELS	
MATH/CSCI 4310	PROBABILISTIC OPERATIONS RESEARCH MODELS	
MATH/STAT 4450	INTRODUCTION TO MACHINE LEARNING AND DATA MINING	
MATH 4900	INDEPENDENT STUDIES	
STAT 4430	LINEAR MODELS	
STAT 4440	TIME SERIES ANALYSIS	
College Breadth (choose one option)		15-30+
Option 1: Complete any UNO minor or undergraduate certificate - 15+ hours		
Option 2: Additional General Education Requirements - 19+ hours		
Additional quantitative literacy - 3 hours		
Additional Social Science Gen. Ed. from 3rd Discipline - 3 hours		
Additional Humanities Gen. Ed. from 3rd Discipline - 3 hours		
HIST 1000 and HIST 1010 - 6 hours		
Additional Nat. and Physical Science w/ Lab - 4-5 hours		
Option 3: CAS comprehensive major (50+ hours) OR any second UNO major (30+ hours)		
Bachelor of Science Cognate Requirement		15
The Bachelor of Science Degree requires at least 15 hours of related Cognate coursework that must be approved by the Mathematics Academic Advisor/Coordinator. Students can also choose a UNO Minor to satisfy their cognate requirement; however, this Cognate minor cannot double-count as the Option 1 minor for the College of Arts & Sciences College Breadth Requirement. A Computer Science Minor cannot satisfy the Cognate requirement for Mathematics. No more than 6 credits of cognate coursework may double-count within the general education requirements.		
ELECTIVES		
Elective hours as required to reach a total of 120 hours		
Mathematics, Bachelor of Science with a Concentration in Data Science Four Year Plan		
Freshman		
Fall		Credits
CMST 1110 or CMST 2120	PUBLIC SPEAKING FUNDS or ARGUMENTATION AND DEBATE	3
ENGL 1150	ENGLISH COMPOSITION I (*)	3
MATH 1950	CALCULUS I (**)	5
Social Science		3
*ENGL 1150: Requires placement.		
**MATH 1950: Requires Math Placement Exam or ACT or SAT scores.		
Credits		14

Spring

ENGL 1160	ENGLISH COMPOSITION II	3
MATH 1960	CALCULUS II	4
Natural/Physical Science with Lab		4
Humanities/Fine Arts Course with Global Diversity		3
Elective		1

Credits **15**

Sophomore**Fall**

MATH 1970	CALCULUS III	4
MATH 2050	APPLIED LINEAR ALGEBRA	3
Humanities/Fine Arts Course		3
Social Science		3
Natural/Physical Science*		3

*N&PS course must be in a 2nd discipline

Credits **16**

Spring

MATH 2230	INTRODUCTION TO ABSTRACT MATH	3
MATH 2350	DIFFERENTIAL EQUATIONS (*)	3
Humanities/Fine Arts Course**		3
Social Science & U.S. Diversity Course***		3
Advanced Writing Requirement^		3

*MATH 2350: It is recommended you take MATH 2050 first, but not required.

**HFA must be in a 2nd discipline

***SS must be in a 2nd discipline

^Advanced Writing Requirement can be: CIST 3000 Advanced Composition for IS&T, ENGL 3050 Writing for the Workplace, ENGL 3980 Technical Writing Across the Discipline, or PHIL 3000 Philosophy Writing Seminar.

Credits **15**

Junior**Fall**

MATH 3230	INTRODUCTION TO ANALYSIS (*)	3
MATH 4740	INTRODUCTION TO PROBABILITY AND STATISTICS I (**)	3
Coding Course 1***		3
Additional Humanities/Fine Arts Course for A&S or Minor/2nd Major Course^		3
Additional Social Science Course for A&S or Minor/2nd Major Course#		3

*MATH 3230: Requires MATH 2230

**MATH 4740: Requires MATH 1970 and MATH 2230

***See Academic Catalog for list of Coding Course Options.

^A&S College Requirement Options. Additional HFA course must be in a 3rd discipline

#A&S College Requirement Options. Additional SS course must be in a 3rd discipline

Credits **15**

Spring

HIST 1000 or Minor/2nd Major Course*		3
MATH 4750	INTRODUCTION TO PROBABILITY AND STATISTICS II (**)	3
Cognate Course		3
MATH 3200 or CSCI 1620	MATHEMATICAL COMPUTING II (***) or INTRODUCTION TO COMPUTER SCIENCE II	3
Cognate Course		3

*A&S College Requirement Options

**MATH 4750: Requires MATH 4740

***MATH 3200: Requires MATH 2200. CSCI 1620: Requires CIST 1400.

Credits **15**

Senior**Fall**

HIST 1010 or Minor/2nd Major Course*		3
STAT 4410	INTRODUCTION TO DATA SCIENCE (**)	3
Data Science Elective/Elective***		3
Cognate Course		3
Cognate Course		3

*A&S College Requirement Options

**STAT 4410: Requires MATH 4740

***Students only need one Data Science Elective. Some are offered only in Fall, others only in Spring. Fall: MATH/CSCI 4300 Deterministic Operations Research Models (prereq: MATH 2050), or STAT 4430 Linear Models (prereq: MATH 4750)

Credits **15**

Spring

STAT 4420	EXPLORATORY DATA VISUALIZATION AND QUANTIFICATION (*)	3
Data Science Elective/Elective**		3
Elective at 3000-4000 Level/Minor/2nd Major Course***		3
Elective at 3000-4000 Level/Minor/2nd Major Course***		3
Cognate Course		3

*STAT 4420: Requires MATH 4750, and CSCI 1620 or MATH 3200

**Students only need one Data Science Elective. Some are offered only in Fall, others only in Spring. Spring: MATH/CSCI 4310 Probabilistic Operations Research Models (prereq: MATH 2050 and MATH 4740), STAT 4440 Time Series Analysis (prereq: MATH 4750 and CSCI 1620 or MATH 3200), or MATH/STAT 4450 Intro to Machine Learning & Data Mining (prereq: MATH 4740)

***Students need at least 120 credits and a minimum of 27 upper level credits throughout the entire degree, with at least 18 credits of upper level coursework taken within the major/concentration. May need to select 3000/4000 level free electives to reach the 27 credit minimum.

Credits **15**

Total Credits **120**

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

This plan is not a contract and curriculum is subject to change

Additional Information About this Plan:

University Degree Requirements: The minimum number of hours for a UNO undergraduate degree is 120 credit hours. Please review the requirements for your specific program to determine all requirements for the program. In order to graduate on-time (four years for an undergraduate degree), you need to take 30 hours each year.

Placement Exams: For Math, English, Foreign Language, a placement exam may be required. More information on these exams can be found at <https://www.unomaha.edu/enrollment-management/testing-center/placement-exams/information.php>

**Transfer credit or placement exam scores may change suggested plan of study